Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

POROCEPHALUS CONSTRICTUS IN A NATIVE FILIPINO

By MAXIMILIAN HERZOG AND CHAS. B. HARE

(From the Biological Laboratory, Bureau of Science, Manila, P. I.)

Pentastomum constrictum, a parasite belonging to the order Linguatulidae (tongue-worms), has been found only a few times in human beings and then only in negroes living in Africa or once in a negro recently migrated from this continent. A specimen of this tongue-worm has, however, now been found in a native Filipino and has been identified as such by Dr. Ch. Wardell Stiles.

According to Braun[1] the Linguatulidae, or tongue-worms, which were formerly believed to be helminthes, belong to the class Arachnoidea (or spiders, to which belong also the mites). They have, in consequence of their parasitic nature, been profoundly modified, so that their body is long, worm-like, either flattened or cylindrical, and more or less annulated. Head, thorax, and abdomen are not differentiated. Anteriorly on the abdominal surface there is an elliptical mouth, surrounded by a ring of chitin and leading into a straight gut which terminates at the hind end. On both sides of the mouth are two hooks which can be retracted into two depressions or grooves. These hooks are generally looked upon as the rudiments of two pairs of legs; however, it seems more rational to consider them the remnants of the palpi labiales and palpi maxillares (Stiles). The whole nervous system consists of a mouth-ring. Sense organs do not exist, except papillae at the anterior end. Organs of circulation or respiration do likewise not exist. The two sexes are separate. In the smaller male the sexual orifice is situated on the ventral surface, but anteriorly; in the female, it is near the anus. The Linguatulidae lay eggs which in an intermediary host give rise to four-legged larvae. There is a second larval stage and during it the parasite gets into its final host, mammalian or reptilian, in whose body the full grown linguatulids live as parasites.

---

[1] Braun. Die Thierischen Parasiten des Menschen, p. 336. Wuerzburg, 1903.

The best-known and most widespread species of the Linguatulidae is *Linguatula rhinaria* (Pilger), known since 1802, and also described under the names *Polystoma taenioides* (Rud.), *Linguatula taenioides* (Lam.), and *Pentastoma taenioides* (Rud.). It has been found in man and in the dog, wolf, fox, horse, and goat. In man it has been encountered, generally in the larval stage, in the liver, kidneys, spleen, and intestines (Zenker, Heschl, Virchow, Wagner, Frerichs, Klebs, Zaeslin). The rare linguatulid which we found here in Manila is described by Braun under the name of *Porocephalus constrictus* (v. Siebold, 1852), and, according to this author, is known only in the larval stage. It is milky white with golden-yellow hooklets, has 23 rings, is 13 millimeters long and 2.2 millimeters wide, and with no thorns at the posterior margin of the body-rings. Braun says that cases in man have been reported by Pruner, Bilharz, Fenger, Aitken, Girard, and Chalmers; and that Pruner also found the parasite in a giraffe.

Chalmers,[1] it appears, has been the most recent (1899) contributor, recording a case of *Pentastomum constrictum* found in a negro, by race a Mendi, from Sierra Leone, Africa, who was admitted, sick, into the hospital of the Gold Coast Colony and who died after a few days. At the necropsy large numbers of the parasite *Pentastomum constrictum* were found in the lungs, liver, alimentary canal, and peritoneal cavity. Chalmers gives the following review of the literature of the subject:

"*Pentastoma constrictum* was first discovered in 1847 by Pruner in Egypt in the livers of two negroes upon whom he made post-mortem examinations. He apparently did not recognize the zoological position of the parasite, but sent specimens to Bilharz and Von Siebold, who published an account of it and gave it the name of *Pentastomum constrictum* in their text-book of zoology.

"The next recorded investigation is that given by Aitken of a case under the care of Dr. Kearney. This observer records the clinical appearance of a negro private of a West Indian regiment who died in January, 1885, at Jamaica, but who had come from St. Helena only eight months previously.

---

[1] Chalmers. A case of *Pentastomum constrictum*. The Lancet, I: 1715. 1899.

" After this there is apparently a long interval without any further records until Girard published an account of the illness and death from purulent meningitis of a Senegalese."

According to Chalmers these were the only cases which, up to 1899, had been reported in human beings. From Braun and Chalmers' statements it appears that all cases reported occurred either in Africa or in negroes which came from Africa. Of his own case Chalmers says that on admission to the hospital the patient was much emaciated and very weak. He had a markedly large and protuberant abdomen, the temperature was slightly above normal and he suffered from a hacking cough with expectoration of a little mucous. The physical signs which were present in the respiratory areas were those of congestion of the lungs with impaired resonance on both sides, and a mucoid expectoration in which no parasites were to be seen. The spleen was very much increased in size, and the liver was enlarged but not tender; the feces were not examined. Nothing was found in the blood. The patient soon after admission developed a temperature of 104° F., rapidly became worse, and died. The parasitic affection was only recognized during the post-mortem examination, and then a large number of parasites were found in the lungs, liver, alimentary canal, and peritoneal cavity. A large number of parasites were found in the small intestine, with the exception of the duodenum. " Nothing," the author says, " is known at present as to the life history of this parasite or as to the means by which it enters the body. It appears to me that it enters by some means into the alimentary canal and that through this it proceeds to the liver and forms cysts, which appear to be dilated biliary ducts, and into the peritoneum. It also seems as though the lungs were affected through the trachea, as cysts therein appear like dilated bronchi. The presence of the parasite in the human body sets up inflammation of the lungs and peritoneum but it does not appear to irritate the alimentary canal or the liver. The only possible means of diagnosis would be the presence of the parasite in the feces in cases of wasting and emaciation in negroes. The disease appears to be confined to negroes and the described cases came from the Island of St. Helena, the City of Kayes, on the river Senegal, in the French Soudan of West Africa, and from the English Colony of Sierra Leone. Pruner does not state where the two negroes who died in Egypt came from."

The case in which a *Pentastomum constrictum* was found in Manila was the following:

Juan Flores, a native Filipino, had been a convict in Bilibid Prison. He had been a sufferer from bone tuberculosis and was admitted to the prison hospital in April, 1905. The clinical diagnosis in his case (Dr. W. R. Moulden) was tubercular abscess of the thigh. The patient died after being in the hospital for fifty-one days.

Post-mortem examination (Hare) on June 24, 1905—anatomic diagnosis: Tuberculosis of the right femur, interstitial nephritis with pyelitis of the left kidney, parenchymatous nephritis of the right kidney, cirrhosis of the liver; great oedema of the brain.

Only a piece of moderate size of the liver, which macroscopically presented the picture of a typical atrophic cirrhosis was kept for histologic examination. This piece was hardened in formalin and when later small cubical pieces were cut out of it a cavity, the size of a millet seed, was cut into. Here the parasite, which had been partly destroyed by the cutting knife, was found. A further search for any more cavities or parasites was negative. Sections from the liver exhibited the histologic picture of an atrophic cirrhosis. Neither another *Pentastomum* nor any *Schistosomum japonicum*[1] were seen.

The parasite found in the liver was sent to Dr. Ch. Wardell Stiles of Washington, to whom we are greatly indebted for its identification. Dr. Stiles in substance reported as follows:

" The parasite from the liver of a native is a tongue-worm. There are two species of this group known to be parasitic in man, namely, *Linguatula taenioides* and *Porocephalus constrictus.* This latter species is looked upon as the larval stage of *Porocephalus armillatus.* Although the specimen sent is quite injured, it could be definitely recognized as not being *Linguatula taenioides,* and, so far as I can determine, from an examination of the fragments, it is the larval form, generally known as *Porocephalus constrictus.* The complete synonymy of the species is as follows:

POROCEPHALUS ARMILLATUS Wyman.

Synonyms—adult forms:

Linguatula armillata Wyman.

---

[1] Since Woolley reported in Vol. I, No. 1 of the Philippine Journal of Science the first case of *Schistosomum japonicum* in a native Filipino, Herzog has encountered a second case, likewise in a native Filipino.

Pentastomum polyzonum Harley; *idem,* Leuckart.

Larval forms:

Pentastomum diesingi Van Beneden.
Pentastomum euryzonum Diesing.
Pentastomum leonis Wedl.
Pentastomum constrictum Von Siebold.
Pentastomum protelis Hoyle.
Linguatula constricta Pruner; *idem,* Bilharz.

The adult stage is reported from the African pythons, *Python sebai* and *P. bivittatus* (*P. molurus*), also from *Felis leo.* The larval form is reported for *Probeles ciristatus, Cynocephalus maimon,* and *Homo sapiens.* Pruner also reports the larval stage for the liver of the giraffe. So far as I am aware, this is the first case found in the Philippines."

Neumann,[1] who a few years ago investigated the subject of linguatulid infection of mammals, comes to the following conclusion: The larvae of *Porocephalus* in the bodies of mammals do not show a tendency to leave their cysts, hence they probably finally perish in them. However, an observation on a lionness shows that they are not absolutely harmless and may cause death in an animal.

This conclusion is probably applicable to human *Pentastomum constrictum* infection, since in only one of the reported cases does death appear to have been directly attributable to these parasites.

---

[1] Neumann. Sur les Porocephales du Chien, etc. Archives de Parasit., II: 356. 1899.